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**CLAIMS 1, 7, 15, 21-23, 38 AND 44 ARE REJECTED UNDER 35 U.S.C. § 102 FOR  
ANTICIPATION BASED UPON MITSUI, U.S. PATENT NO. 5,635,315 (HEREINAFTER MITSUI '315)**

On page two of the Office Action, the Examiner asserted that Mitsui '315 identically discloses the claimed invention. This rejection is respectfully traversed.

The factual determination of anticipation under 35 U.S.C. § 102 requires the identical disclosure of each element of a claimed invention in a single reference. As part of this analysis, the Examiner must (a) identify the elements of the claims, (b) determine the meaning of the elements in light of the specification and prosecution history, and (c) identify corresponding elements disclosed in the allegedly anticipating reference. That burden has not been discharged.

Independent claims 1, 15 and 38 each recite "a phase shifter film ... formed by using a reactive long throw sputtering device." The Examiner, however, has already admitted that that "Mitsui does not teach that the films are formed by a long throw sputtering device or method." Therefore, by the Examiner's own admission, Mitsui fails to identically describe the claimed invention, as recited in independent claims 1, 15 and 38, within the meaning of 35 U.S.C. § 102.

Notwithstanding the admission that Mitsui '315 does not anticipate the claimed invention, the Examiner asserted that "a [phase shifter film] formed by any method would function as well as the instant film, blank or mask." This assertion by the Examiner, however, is factually unsupported since that Examiner has failed to supply any reference that corroborates the Examiner's assertion. Furthermore, the Examiner has failed to provide any reasoned statement as

to why the Examiner believes that the claimed prior product and the product of the prior art appear to be identical or substantially identical.

The case law is clear that a product-by-process limitation must be considered by the Examiner in making a determination of novelty or obviousness. Although the Examiner has a reduced burden of proof with regard to product-by-process claims, as discussed in M.P.E.P. § 2113, the Examiner must first provide a rationale to show that the claimed product and prior art products actually do appear to be identical or substantially identical. As discussed above, the Examiner has failed to make any reasoned argument as to why the claimed phase shifter film, which is formed using a long throw sputtering device, is identical or substantially identical to the phase shift film of Mitsui '315. Therefore, the Examiner has failed to meet the requirements established by case law and M.P.E.P. § 2113 regarding product-by-process limitations.

Notwithstanding the Examiner's failure to give proper weight to the product-by-process limitation recited in the claims, the recited product-by-process limitation results in a structural difference between the claimed invention and the phase shifter film disclosed by the applied prior art. When a phase shifter film is formed by long throw sputtering, as compared to when the phase shifter film is formed by another method, the resultant film exhibits high transmittance in ArF laser exposure light wavelength (193 nm) and KrF laser exposure light wavelength (248 nm) (see page 32, lines 8-25 of Applicants' disclosure).

The characteristics described above are a result of several factors. In a long throw sputtering system, the phase shifter film is formed by low-pressure sputtering with the active or

reactive gas having a low density. For this reason, the particles of molybdenum silicide sputtered from the sputtering target reach the substrate rectilinearly, producing a high density film that results in a high refractive index. Also, in a long throw sputtering system, the L/S distance is sufficiently long so that a small possibility exists that the reactive gas reaches the sputtering target. By reducing the incidence of reactive gas reaching the sputtering target, oxidation and nitriding of the sputtering target is reduced; and therefore, the occurrence of defects in the particles of the film or of pinholes can also be reduced. Still further, by using a long throw sputtering system, even if the supply amount of reactive gas is increased, the gas is still unlikely to reach the sputtering target. Accordingly, the film can undergo sufficient oxidation and nitriding, and thus, a phase shifter film of high transmittance can be obtained. Therefore, for the reasons stated above, a phase shifter film formed by a long throw sputtering system is not physically identical to the phase shifter film of the applied prior art. Applicants, therefore, respectfully solicit withdrawal of the imposed rejection of claims 1, 7, 15, 21-23, 38 and 44 for anticipation based upon Mitsui '315.

**CLAIMS 60-62 ARE REJECTED UNDER 35 U.S.C. § 102 FOR ANTICIPATION BASED UPON MITSUI, U.S. PATENT NO. 5,942,356 (HEREINAFTER MITSUI '356)**

On page three of the Office Action, the Examiner asserted that Mitsui '356 identically discloses the claimed invention. This rejection is respectfully traversed.

Independent claim 60 recites a "phase shifter film ... formed by using a reactive long throw sputtering device." As in the prior rejection, the Examiner admitted that that Mitsui '356 does not teach that the phase shifter film is formed by a long throw sputtering device or method.

Therefore, by the Examiner's own admission, Mitsui fails to identically describe the claimed invention, as recited in independent claim 60, within the meaning of 35 U.S.C. § 102.

Notwithstanding the admission that Mitsui '356 does not anticipate the claimed invention, the Examiner also asserted that "a [phase shifter film] formed by any method would function as well as the instant film, blank or mask." Similar to the prior rejection, the Examiner failed to supply any reference that corroborates the Examiner's assertion. As such, the Examiner's assertion is without factual basis. Even *assuming arguendo* that a phase shifter film formed by another method functions as well as the claimed phase shifter film formed by long throw sputtering, this happenstance would be irrelevant to whether or not Mitsui '356 identically discloses the claimed invention. Applicants have claimed a particular feature, and the Examiner is not free to assert that a non-identical feature "identically discloses" the claimed feature, even if one assumes (without a factual basis) the non-identical feature functions as well as the claimed feature, while ignoring the requirement in 35 U.S.C. § 102 that an applied reference identically discloses each feature of the claimed invention.

Notwithstanding the arguments presented in preceding paragraph, the phase shifter film formed by long throw sputtering differs from the phase shifter films of the applied prior art. As argued above in the prior rejection and described in Applicants' disclosure, the claimed phase shifter film formed by long throw sputtering exhibits high transmittance in ArF laser exposure light wavelength (193 nm) and KrF laser exposure light wavelength (248 nm). Applicants, therefore, respectfully solicit withdrawal of the imposed rejection of claims 60-62 for anticipation based upon Mitsui '356.

**Claims 1-7 and 15-21 are rejected under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani et al., JP 08-127870 (hereinafter Nagatani), Isao et al., U.S. Patent No. 5,938,897 (hereinafter Isao), and Yamanishi, U.S. Patent No. 5,322,605**

On page four of the Office Action, the Examiner referred to same rejection found in the Office Action dated January 16, 2003, in which the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the teachings of Mitsui '356 in view of Isao and Yamanishi to arrive at the claimed invention. This rejection is respectfully traversed.

In response, Applicants incorporate herein the arguments presented in pages 14-19 of the Amendment filed June 16, 2003. To summarize these arguments: the teachings of Nagatani have been improperly broadened; a reasonable expectation of success for modifying Mitsui '356 in view of Nagatani to arrive at improved uniformity of film thickness has not been established; and it cannot be properly asserted that it would have been obvious to modify Mitsui '356 in view of Nagatani to use a long-throw sputtering device since there is no established clear and particular factual findings that the method of Nagatani is better than the method of Mitsui '356.

The Examiner's response to Applicants' arguments is found on pages 5-7 of the Office Action dated September 6, 2003. In the first full paragraph on page 6 of the Office Action, the Examiner referred to column 2, lines 11-27 of Mitsui '356 asserting that "[t]he '356 reference recognizes the criticality of forming thin uniform films for phase shifters" (emphasis added). The Examiner then asserted that "Nagatani teaches that the LTS method provides uniform coverage" (emphasis added). Based on these two assertions, the Examiner concluded that "[o]ne

of ordinary skill in the art at the time of the invention would be motivated to use the LTS method to sputter the MoSiON of the '356 reference because it solves a problem identified by the '356 reference."

This analysis by the Examiner suffers from several flaws. One of the Examiner's basic assumptions is that Mitsui '356 teaches the criticality of forming thin uniform films for phase shifters. However, upon reviewing column 2, lines 11-27 of Mitsui '356, which the Examiner cited for support, Applicants have been unable to discover any teachings regarding the criticality of a uniform film. Neither the term "uniform" nor an analogous term is used in this particular excerpt cited by the Examiner, and thus, the Examiner cannot properly cite to column 2, lines 11-27 of Mitsui '356 for teaching the criticality of forming thin uniform films for phase shifters.

Other flaws of the Examiner's analysis were elaborated on in the Amendment filed June 16, 2003. These flaws include the Examiner failing to establish that the method of Nagatani provides a more uniform film thickness than the method disclosed by Mitsui '356. Furthermore, even if it could be established that the method of Nagatani provides a more uniform film than the film formed by the method of Mitsui '356, Nagatani does not disclose in the Abstract exactly what aspect of Nagatani provides the asserted "improved ... uniformity in film thickness distribution." Thus, the improved uniformity in film thickness distribution has not been established as being based upon the use of a long-throw sputtering device. Still further, the Examiner has not factually established that one having ordinary skill in the art would have recognized that any benefit of Nagatani would also apply to phase shifter films. Although these arguments were presented in the Amendment filed June 16, 2003, the Examiner did not address any of these arguments in the

Examiner's "Response to Arguments" portion of the Office Action. In this regard, the Examiner is referred to M.P.E.P. § 707.07(f), which states that "the Examiner, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

With regard to Yamanishi, the Examiner arguments appear to be based on the assertion that "Yamanishi's teachings are in the same art as those of the '356 reference and Nagatani viz. vapor deposition techniques for thin films ... [and] both methods use reactive ion sputtering and Yamanishi provides improvements to the process." Notwithstanding that Yamanishi describes benefits for supplying the inert gas and the reactive gas into a chamber by separate inlets, the Examiner has failed to establish that Yamanishi teaches that these benefits would also apply to a long-throw sputtering device. In addition, the Examiner has failed to establish that these benefits (even if transferable to a long-throw sputtering device) would also apply when the long-throw sputter device is used to form a phase shifter film. Yamanishi does not describe what type of films would benefit from separately supplying inert gas and reactive gas into the chamber. As such, there are no established facts that would have realistically motivated one having ordinary skill in the art to separately supply inert gas and reactive gas into a chamber of a long throw sputtering device to form a phase shifter film, as recited in claims 2 and 16. The Examiner's other cited reference of Isao does not cure the deficiencies of Mitsui '356, Nagatani and Yamanishi. Applicants, therefore, respectfully submit that the imposed rejection of claims 2 and 16 under 35 U.S.C. § 103 for obviousness is not viable and, hence, solicit withdrawal thereof.

With regard to claims 3 and 17, Applicants note that the Examiner has failed to allege where any of the applied references teach or suggest that the reactive gas is introduced into the substrate



side and the inert gas is introduced into the target side. Therefore, claims 3 and 17 further distinguish the claimed invention over the applied prior art.

Claims 4-7 and 18-21 respectively depend from independent claims 1 and 17, and Applicants respectfully submit that these claims are patentable over the applied prior art at least for the same basis that claims 1 and 17 are patentable over the applied prior art. Applicants, therefore, respectfully submit that the imposed rejection of claims 1-7 and 15-21 under 35 U.S.C. § 103 for obviousness is not viable and, hence, solicit withdrawal thereof.

**Claims 22-62 are rejected under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao, and Yamanishi, and further in view of the publication to Angelopoulos**

On page four of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the teachings of Mitsui '356 in view of Nagatani, Isao, Yamanishi and Angelopoulos to arrive at the claimed invention. This rejection is respectfully traversed.

Claims 23-26 are dependent from independent claim 17, and Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 17 under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao and Yamanishi. Specifically, the Examiner has failed to establish any facts that would have realistically motivated one having ordinary skill in the art to use a reactive long throw sputtering device for forming a phase shifter film. Independent claims 38, 45, 60 and 61 additionally include this distinguishing

limitation. The Examiner's reference to Angelopoulos, however, does not cure the argued deficiencies of Mitsui '356, Nagatani, Isao and Yamanishi. Applicants, therefore, respectfully submit that the imposed rejection of claims 22-62 under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao, Yamanishi and Angelopoulos is not viable and, hence, solicit withdrawal thereof.

**Claims 66-71 are rejected under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao, and Yamanishi, and further in view of Mitsui '315**

On page four of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the teachings of Mitsui '356 in view of Nagatani, Isao, Yamanishi and Mitsui '315 to arrive at the claimed invention. This rejection is respectfully traversed.

Claims 66-71 are dependent from independent claim 1, and Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao and Yamanishi. Specifically, the Examiner has failed to establish any facts that would have realistically motivated one having ordinary skill in the art to use a reactive long throw sputtering device for forming a phase shifter film. The Examiner's additional reference to Mitsui '315, however, does not cure the argued deficiencies of Mitsui '356, Nagatani, Isao and Yamanishi. Applicants, therefore, respectfully submit that the imposed rejection of claims 22-62 under 35 U.S.C. § 103 for obviousness based upon Mitsui '356 in view of Nagatani, Isao, Yamanishi and Mitsui '315 is not viable and, hence, solicit withdrawal thereof.

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicants hereby respectfully request reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in black ink, appearing to read 'Scott D. Paul', is written over the printed name.

Scott D. Paul  
Registration No. 42,984

600 13<sup>th</sup> Street, N.W.  
Washington, DC 20005-3096  
(202) 756-8000 SDP/AJS:kap  
**Date: December 15, 2003**  
Facsimile: (202) 756-8087